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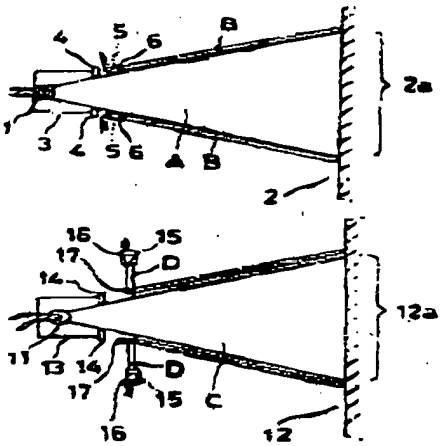
(54) CONFIRMING METHOD FOR RADIATION OR IRRADIATED AREA

(57) Abstract:

PURPOSE: To confirm easily a radiation area and an irradiated area when a distance between a detector or a light source and an object changes by arranging visible rays approximately parallel to the external or internal edge of invisible radiations that are radiated from the objects or irradiated to the objects.

CONSTITUTION: A plurality of parallel visible rays B along the external edge of infrared radiations A radiated from a radiation area of an object 2 to be inspected toward an infrared detector 1 is irradiated from a light source 5 to an object 2 to be inspected. A radiation area 2a is confirmed directly from the reflected light. In this case when detector 1 or the object 2 travels to cause a change in the radiation area 2a, an irradiation position of the beam to the surface of the object follows the variation. On the other hand, a mirror 17 reflects approximately parallel visible radiations D from a light source 15 in the direction of an object 12 in parallel to the external edge of infrared radiations C from a light source 11. The confirmation of an irradiation area 12a is performed by a visual observation of visible rays reflected from the object surface.



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from Atty. W.A. DRUCKER

Re Prior Art - Japan

(A) JAPAN - S 57-22521

pp 105, 106, 107

English Text / English Abstract

(B) JAPAN - 62-12848 pp 39-43

Claim in English

~~English Abstract~~

る。第１図に物体から放射される不可視光線として例えば赤外線を検出する場合における照射領域確認方法を示したもので、図中１は２から放射される赤外線を検出する赤外線検出器、２ａは検出器１への赤外線放射領域（測定領域）、３は前記検出器１を収納した筐体、４は筐体の前面開部に設けられたコリメータ、５…は可視光を発する光源例えば豆ランプ等で、物体表面の放射領域２ａより検出器１に向かつて放射される赤外線Ａの外縁にできるだけ近付けた状態で設けられている。又、各光源５…には図面に凹状のカバー６…が被せてあつて、コリメータ又はレンズにより前方にのみ略平行な可視光線Ｂ…を発するように構成されていると共に、該可視光線Ｂの方向が前記赤外線Ａの外縁に略平行となるように調整されている。尚、光源５…は放射領域２ａを明らかにするために測定開始当初時のみに設ける必要がある。

この実施例によればコリメータ４にて定まる入

をくぐり抜けて放射領域２ａから検出器１内かつ放射される赤外線Ａの外縁に沿つた略平行な複数の略平行可視光線Ｂ…が被検物体２に照射されているので、その反射光から直ぐに放射領域２ａを確認することができる。そしてこの確認方法によれば、検出器１又は被検物体２の一方が移動して放射領域２ａが変化しても可視光線Ｂ…の物体表面への照射位置が前記変化に追随するため、常に正確な放射領域を確認することができるものである。

次に第２図は物体に不可視光線として例えば赤外線を照射する場合における照射領域の確認方法を示したものであり、図中、１１は赤外線光源、１２は該光源より発する赤外線Ｃが照射される物体、１２ａはその照射領域、１３は前記光源１１を収納する筐体、１４はコリメータ（但し、コリメータは外に例えば凹レンズ又は凸レンズを用ることもできる。）、１５…は可視光を発する光源で前記実施例と同様、豆ランプ等を用い且つ前方

にのみ略平行可視光（たとえば細い可視光）を発するようにコリメータ、又はレンズを有するカバー１６が設けられている。１７…は前記光源１５…から発せられた略平行可視光線Ｄを前記赤外線Ｃの外縁に略平行し且つそれに沿つて物体１２方向に反射するミラーである。

しかしてこの実施例における照射領域１２ａの確認は前記実施例における放射領域の確認と同様な方法、即ち物体表面から反射される可視光を目視することによつて行なうことができるのである。

尚、この実施例及び前述した実施例においては略平行可視光線Ｂ又はＤを赤外線Ａ又はＣの外縁に略平行に沿わせているが、赤外線の内縁に略平行に沿わせる態様で実施することができるし、また複数本の略平行可視光線の数本を外縁に沿りの数本を内縁にそれぞれ略平行に沿わせた態様で実施することもできる。

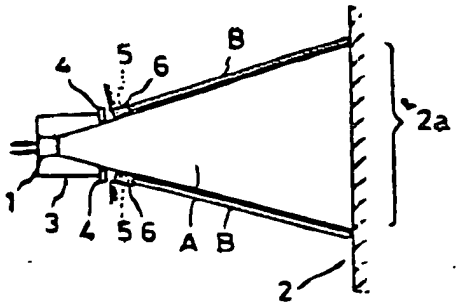
この発明に係る放射又は照射領域確認方法は以上説明した如く、物体から放射され若しくは物体に照射された不可視光線の外縁若しくは内縁に沿つて略平行となるように複数の略平行可視光線を前記物体に照射し、物体からの可視光線の反射光により不可視光線の放射又は照射領域を確認するようにしたものであるから前記放射領域又は照射領域を測定者が目視することによつて簡単に且つ直接的に確認することができるものであり、特に検出器及び光源と被検物体との位置関係に変化が生じるとき、即ち、放射領域又は照射領域が変化する場合でも迅速よく正確に確認できるという顕著な効果を奏する。

4　図面の簡単な説明

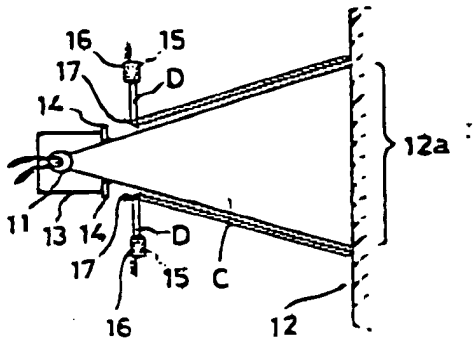
第１図は放射領域を確認する方法を示した図、第２図は照射領域を確認する方法を示した図である。

２、１２…物体、　Ａ、Ｃ…不可視光線

Ｂ、Ｄ　…可視光線。



第 2 図



374/121

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(12)Disclosure Patent Application Official Report S57-22521

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G 01 J 5/02		7172-2G	
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(54)Confirmation method of radiation or irradiated area

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(21)Date of Application: S54-9784
15.7.1980

(72)Name of Inventor: Yasishirou Imagawa

Detailed description

Aiming System

1. Name of invention: Confirmation method of radiation or irradiated area

2. Area of the patent claim:

A method of confirming a radiation area of an object surface of an invisible beam radiated from the object surface, or a radiation area of an object surface of said invisible beam irradiated to the object surface comprising:

irridiating a plurality of visible rays, leaving an appropriate space therebetween around said invisible beam, which goes straight to said object surface substantially parallel to external edge of said invisible beam in an external or internal side close to said edge; and

confirming said radiation area or radiated area of said object surface of said invisible ray through reflected rays of said viisible rays from said object surface.

3. Detailed explanation of the invention

This invention is related to the method of confirmation that makes clear the invisible area of radiation from the object and irradiated to the object.

The surface temperature of objects such as the human body or iron etc. can be measured using IR-detectors to detect the infrared energy radiated from the object. In this case it is a necessary condition of the measurement to define the measurement area which radiates the IR-energy from the object to the detector. Since in general the measurement area can be determined based on the structure of the detector and the distance to the object, one can confirm the area when one uses collimation type of optics. However this method of confirmation is based on the assumption that the distance of the detector and object is fixed, if the detector or object is moving and the distance between the detector and object is changing, e.g. such a case occurs when one uses a handytype of detector, the above mentioned method cannot make a confirmation of the radiation area.

This disadvantage is realized in both cases, when one measures infrared invisible energy from the object and also when one irradiates invisible light against the object. This problem occurs in a more general sense when one handles invisible light.

Therefore this invention presents a new method which simply confirmes, by using the eyes, the radiation area from the object and also the irradiated area of the object, when the distance between detector and object or source of invisible light and object is changing.

The figures explain a prefered embodiement of the invention. Fig. 1 shows the method of confirming the radiation area of the object for instance when using IR detectors. The detector (1) detects the IR-radiation radiated from the object (2). (2a) is the infrared radiation area (measurement area) of the detector (1).(3) is the enclosure which includes the detector. (4) is the collimator which is set in front of the said enclosure. (5) is the source which radiates the visible light, for example a small lamp. The small lamp is located so as to be close to the outer zone of the IR area which radiates from (2a). Also the light source (5) can have a cylinder type of cover which gives parallel visible light that can radiate to the front through the lens or collimator. And also the direction of this light source is to be adjusted to become parallel to the outside zone of the invisible radiation. The lamp source (5) may be installed in multiple numbers with some reasonable distances between them to give a more clear indication of the radiation area (2a).

If one uses this type of preferred embodiement, one can define the radiation area (2a) using the angle of incidence which is determined by the collimator (4) and the distance between detector (1) and object (2). However if one does not take this definition one can also confirm the radiation area (2a) more easily because one can have multiple visible sources which radiate to the object in parallel to the outside of the infrared beam, which radiates from the area (2a) to the detector (1), and one can confirm the radiation area (2a) based on the reflected light projected from the multiple visible sources. If one uses this confirmation method one can confirm very accurately the radiation area because if detector (1) or object (2) is moving, which changes the radiation area (2a), this visible source can follow the change in distance between the detector and object.

Fig. 3 shows the method of confirmation of the irradiated area when one irradiates an invisible source, e.g. IR-light, to the object. (11) is the IR light source. (12) is the object which receives radiation from the invisible source (11). (12a) is the irradiated area. (13) is the enclosure which includes the said light source (11). (14) is the collimator (not only collimators, one can also use a convex or concave lens) (15) is the light source which radiates the visible light. In this case one can also use a small lamp and can also install the cover which holds the collimator or the lens and which radiates the parallel visible ray to the front. (17) is a mirror which reflects light radiated from the light source (15) parallel to the outside of the infrared beam.

Therefore one can confirm the irradiated area (12a) because one can see the reflection of the visible ray from the surface of the object. This is the same method which was explained previously.

In the above two prefered embodiements multiple visible light rays are set parallel along the outside of the invisible beam. But one can locate visible rays also parallel along the inside of the invisible beam. And also one can locate several visible rays along the outside and other visible rays along the inside of the beam. This method of confirmation of the irradiated area and radiation area related to this invention is explained in all the above paragraphs; one radiates the multiple visible rays parallel along the outside or the inside of the irradiated or radiation area of the object, and one can easily confirm the invisible irradiated or radiation area from the reflection of these visible rays from the target surface. Therefore one can confirm by ones eyes the said invisible irradiated area and radiation area. This invention gives a significant effect to confirm the area very accurately when the distance between detector and object or light source and object changes i.e. the irradiation or radiation area is changing.

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 10 7987

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	US-A-3 081 632 (S.N.HOWELL) * column 2, lines 37 - 65; figure *	1,3,5	G 01 J 5/00
A	DE-C-3 710 486 (TESTOTHERM MESSTECHNIK) * claim 1; figure 1 *	1	
A	US-A-4 081 678 (TH.F.MACALL) * figure 1 *	5	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

G 01 J

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
Berlin	29 November 91	FUCHS R

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same catagory
A : technological background
O : non-written disclosure
P : intermediate document
T : theory or principle underlying the invention

E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document